

One x One Degree
Climate Change Atlas Tree Species
 Current and Potential Future Habitat, Capability, and Migration

	sq. km	sq. mi	FIA Plots
Area of Region	3,156.7	1,218.8	43

Species Information

The columns below provide brief summaries of the species associated with the region and described in the table on the next pages. Definitions are provided in the Excel file for this region.

Genus	Species	Abundance		Model		Potential Change in Habitat Suitability		Capability to Cope or Persist		Migration Potential					
				Reliability	Adaptability	Scenario RCP45	Scenario RCP85	Scenario RCP45	Scenario RCP85	SHIFT RCP45	SHIFT RCP85				
Ash	3			High	14	19	Increase	15	12	Very Good	5	6	Likely	1	1
Hickory	2			Medium	27	35	No Change	5	10	Good	9	7	Infill	7	7
Maple	5	Abundant	1	Low	22	11	Decrease	16	14	Fair	8	9	Migrate	7	14
Oak	7	Common	21	FIA	5		New	27	27	Poor	4	3		15	22
Pine	3	Rare	19				Unknown	5	5	Very Poor	8	6			
Other	21	Absent	27					68	68	FIA Only	2	2			
	41		68		68	65				Unknown	0	0			
											36	33			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	48.6	50.6	53.4	53.3	
	CCSM85	48.6	51.0	53.8	57.1	
	GFDL45	48.6	53.2	54.9	56.2	
	GFDL85	48.6	52.2	56.1	60.9	
	HAD45	48.6	51.9	55.4	57.2	
Growing Season (May-Sep)	CCSM45	65.6	67.5	69.8	70.0	
	CCSM85	65.6	67.8	70.4	74.3	
	GFDL45	65.6	70.9	73.2	74.8	
	GFDL85	65.6	70.1	74.6	79.8	
	HAD45	65.6	69.1	71.9	74.3	
Coldest Month Average	CCSM45	22.9	25.0	27.5	27.5	
	CCSM85	22.9	26.1	27.6	29.7	
	GFDL45	22.9	25.6	27.5	28.3	
	GFDL85	22.9	26.5	28.2	30.7	
	HAD45	22.9	25.0	28.5	28.6	
Warmest Month Average	CCSM45	71.8	74.1	75.6	75.8	
	CCSM85	71.8	74.8	76.5	78.7	
	GFDL45	71.8	74.9	77.3	78.3	
	GFDL85	71.8	76.3	78.9	81.7	
	HAD45	71.8	75.9	77.4	79.2	
HAD85	71.8	75.8	78.9	83.4		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	35.0	34.9	33.6	36.1	
	CCSM85	35.0	36.3	35.6	35.5	
	GFDL45	35.0	38.5	40.0	39.5	
	GFDL85	35.0	36.1	39.2	40.3	
	HAD45	35.0	35.5	36.8	37.1	
Growing Season (May-Sep)	CCSM45	16.0	15.8	14.4	15.6	
	CCSM85	16.0	15.5	14.8	14.1	
	GFDL45	16.0	16.7	16.3	15.9	
	GFDL85	16.0	15.6	15.6	14.9	
	HAD45	16.0	15.4	14.1	15.3	
HAD85	16.0	15.6	13.0	13.7		

NOTE: For the six climate variables, four 30-year periods are used to indicate six potential future trajectories. The period ending in 2009 is based on modeled observations from the PRISM Climate Group and the three future periods were obtained from the NASA NEX-DCP30 dataset. Future climate projections from three models under two emission scenarios show estimates of each climate variable within the region. The three models are CCSM4, GFDL CM3, and HadGEM2-ES and the emission scenarios are the 4.5 and 8.5 RCP. The average value for the region is reported, even though locations within the region may vary substantially based on latitude, elevation, land-use, or other factors.

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Current and Potential Future Habitat, Capability, and Migration

Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
green ash	Fraxinus pennsylvanica	WSH	Low	68.1	1513.5	32.1	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
red maple	Acer rubrum	WDH	High	39.4	463.2	16.3	No change	No change	High	Common	Good	Good			1	2
silver maple	Acer saccharinum	NSH	Low	43	375.4	13.4	No change	No change	High	Common	Good	Good			1	3
eastern cottonwood	Populus deltoides	NSH	Low	19.6	346.5	8.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	4
white ash	Fraxinus americana	WDL	Medium	38.5	272.6	7.1	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	5
white spruce	Picea glauca	NSL	Medium	0.2	250.6	5.4	Very Lg. dec.	Very Lg. dec.	Medium	Common	Lost	Lost			0	6
American basswood	Tilia americana	WSL	Medium	19	199.9	10.5	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	7
American elm	Ulmus americana	WDH	Medium	56.9	193.0	6.3	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	8
sugar maple	Acer saccharum	WDH	High	22.6	192.9	10.2	Lg. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	9
black cherry	Prunus serotina	WDL	Medium	23.9	177.0	6.6	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	10
bitternut hickory	Carya cordiformis	WSL	Low	8.9	165.8	14.6	Sm. dec.	No change	High	Common	Fair	Good			1	11
shagbark hickory	Carya ovata	WSL	Medium	21.5	158.7	7.0	Sm. inc.	No change	Medium	Common	Good	Fair			1	12
eastern white pine	Pinus strobus	WDH	High	3.2	136.5	43.1	Sm. dec.	Lg. dec.	Low	Common	Poor	Very Poor	Infill +		0	13
Scots pine	Pinus sylvestris	NSH	FIA	6.3	128.8	20.3	Unknown	Unknown	NA	Common	NNIS	NNIS			0	14
northern red oak	Quercus rubra	WDH	Medium	18.7	119.8	7.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	15
swamp white oak	Quercus bicolor	NSL	Low	37.9	89.0	5.7	Sm. inc.	No change	Medium	Common	Good	Fair			1	16
black locust	Robinia pseudoacacia	NDH	Low	10.1	86.6	16.1	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	17
black willow	Salix nigra	NSH	Low	31.1	80.3	6.1	No change	Sm. inc.	Low	Common	Poor	Fair			1	18
bur oak	Quercus macrocarpa	NDH	Medium	9.5	73.2	7.7	Sm. dec.	No change	High	Common	Fair	Good	Infill ++		2	19
boxelder	Acer negundo	WSH	Low	27.3	58.2	5.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	20
white oak	Quercus alba	WDH	Medium	9.9	54.7	9.1	Sm. inc.	No change	High	Common	Very Good	Good	Infill ++	Infill ++	2	21
black walnut	Juglans nigra	WDH	Low	18.2	53.3	3.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	22
quaking aspen	Populus tremuloides	WDH	High	31.1	46.2	4.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	23
American beech	Fagus grandifolia	WDH	High	10.1	45.8	9.0	Lg. inc.	No change	Medium	Rare	Good	Poor	Infill ++	Infill +	1	24
bigtooth aspen	Populus grandidentata	NSL	Medium	6.3	31.4	5.0	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	25
northern pin oak	Quercus ellipsoidalis	NSH	Medium	3.2	28.2	8.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	26
black ash	Fraxinus nigra	WSH	Medium	9.9	22.0	3.7	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	27
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	9.5	21.1	2.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	28
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	9.5	18.3	1.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	29
yellow-poplar	Liriodendron tulipifera	WDH	High	3.2	11.9	3.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	30
chokecherry	Prunus virginiana	NSLX	FIA	16.9	10.5	1.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	31
Norway spruce	Picea abies	NSH	FIA	3.2	8.6	2.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	32
Norway maple	Acer platanoides	NSL	FIA	3.2	8.6	2.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	33
butternut	Juglans cinerea	NSLX	FIA	4.9	7.9	1.1	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	34
pin oak	Quercus palustris	NSH	Low	9.9	7.2	2.0	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	35
pin cherry	Prunus pensylvanica	NSL	Low	4.9	6.3	0.9	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	36
eastern hemlock	Tsuga canadensis	NSH	High	3.2	5.8	1.8	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	37
serviceberry	Amelanchier spp.	NSL	Low	3.2	5.5	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	38
yellow birch	Betula alleghaniensis	NDL	High	3.2	5.3	1.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	39
red pine	Pinus resinosa	NSH	Medium	11.8	4.6	5.4	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	40
black oak	Quercus velutina	WDH	High	3.2	3.0	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	41
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	42
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	43
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	44
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	45
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	46
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	47

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Northern Research Station
Landscape Change Research Group
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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIaiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	48
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	49
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	50
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	51
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	52
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	53
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	54
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	55
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	56
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	57
shingle oak	Quercus imbricaria	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	58
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	59
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	60
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	61
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	62
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	63
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	64
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	65
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	66
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	67
slippery elm	Ulmus rubra	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	68